SEQUENCE LISTING

<110> PETER S.N. ROWE

<120> REGULATION OF TISSUE MINERALIZATION AND
PHOSPHATE METABOLISM BY ASARM PEPTIDES

<130> 21105.0011U2

<140> 10/567,938
<141> 2006-07-13

<150> PCT/US04/30530
<151> 2003-09-19

<160> 17

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 20
<212> PRT
<213> Artifical Sequence

<400> 1
Pro Arg Asp Asp Ser Ser Glu Ser Ser Asp Ser Gly Ser Ser Ser Glu
1 5 10 15
Ser Asp Gly Asp
20

<210> 2
<211> 18
<212> PRT
<213> Artifical Sequence

<400> 2
Arg Asp Ser Ser Glu Ser Ser Ser Ser Gly Ser Ser Ser Glu Ser His
1 5 10 15
Gly Asp

<210> 3
<211> 18
<212> PRT
<213> Artifical Sequence

<400> 3
Arg Asp Ser Ser Glu Ser Ser Ser Ser Gly Ser Ser Ser Glu Ser Ser
1 5 10 15
Gly Asp

<210> 4
<211> 19
<212> PRT
<213> Artifical Sequence

<400> 4

```
Arg Glu Asp Ser Ser Glu Ser Ser Asp Ser Gly Ser Ser Ser Glu Ser
 1               5                  10                  15
Asp Gly Asp
```

<210> 5
<211> 44
<212> PRT
<213> Artifical Sequence

<400> 5

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Asn Lys Gly Met Pro Gln Gly Lys Gly Ser Trp Gly Arg Gln Pro His
 1               5                  10                  15
Ser Asn Arg Arg Phe Ser Ser Arg Arg Arg Asp Asp Ser Ser Glu Ser
            20                  25                  30
Ser Asp Ser Gly Ser Ser Ser Glu Ser Asp Gly Asp
        35                  40
```

<210> 6
<211> 44
<212> PRT
<213> Artifical Sequence

<400> 6

```
Asn Lys Gly Met Ser Gln Arg Arg Gly Ser Trp Pro Ser Arg Arg Pro
 1               5                  10                  15
Asn Ser His Arg Arg Ala Ser Thr Arg Gln Arg Asp Ser Ser Glu Ser
            20                  25                  30
Ser Ser Ser Gly Ser Ser Ser Glu Ser His Gly Asp
        35                  40
```

<210> 7
<211> 44
<212> PRT
<213> Artifical Sequence

<400> 7

```
Asn Arg Gly Met Ser Gln Arg Arg Gly Ser Trp Ala Ser Arg Arg Pro
 1               5                  10                  15
His Pro His Arg Arg Val Ser Thr Arg Gln Arg Asp Ser Ser Glu Ser
            20                  25                  30
Ser Ser Ser Gly Ser Ser Ser Glu Ser Ser Gly Asp
        35                  40
```

<210> 8
<211> 39
<212> PRT
<213> Artifical Sequence

<400> 8

```
Ser Gln Ser Glu Glu Ser His Ser Glu Glu Asp Asp Ser Asp Ser Gln
 1               5                  10                  15
Asp Ser Ser Arg Ser Lys Glu Asp Ser Asn Ser Thr Glu Ser Lys Ser
            20                  25                  30
Ser Ser Glu Glu Asp Gly Gln
        35
```

<210> 9

<211> 40
<212> PRT
<213> Artifical Sequence

<400> 9
Pro Gln Gly Lys Gly Ser Trp Gly Arg Gln Pro His Ser Asn Arg Arg
 1   5   10   15
Phe Ser Ser Lys Arg Arg Asp Asp Ser Ser Glu Ser Ser Asp Ser Gly
            20   25   30
Ser Ser Ser Glu Ser Asp Gly Asp
        35   40

<210> 10
<211> 41
<212> PRT
<213> Artifical Sequence

<400> 10
Ser Gln Arg Arg Gly Ser Trp Pro Ser Arg Arg Pro Asn Ser His Arg
 1   5   10   15
Arg Ala Ser Thr Arg Arg Gln Arg Asp Ser Ser Glu Ser Ser Ser Ser
            20   25   30
Gly Ser Ser Ser Glu Ser His Gly Asp
        35   40

<210> 11
<211> 40
<212> PRT
<213> Artifical Sequence

<400> 11
Ser Gln Arg Arg Gly Ser Trp Ala Ser Arg Arg Pro His Pro His Arg
 1   5   10   15
Arg Val Ser Thr Arg Gln Arg Asp Ser Ser Glu Ser Ser Ser Ser Gly
            20   25   30
Ser Ser Ser Glu Ser Ser Gly Asp
        35   40

<210> 12
<211> 36
<212> PRT
<213> Artifical Sequence

<400> 12
Met Lys Phe Leu Val Phe Ala Phe Ile Leu Ala Leu Met Val Ser Met
 1   5   10   15
Ile Gly Ala Asp Ser Ser Glu Glu Lys Phe Leu Arg Arg Ile Gly Arg
            20   25   30
Phe Gly Tyr Gly
        35

<210> 13
<211> 180
<212> PRT
<213> Artifical Sequence

<400> 13
Gln Thr Gly Phe Ala Gly Pro Ser Glu Ala Glu Ser Thr His Leu Asp
 1   5   10   15

```
Thr Lys Lys Pro Gly Tyr Asn Glu Ile Pro Glu Arg Glu Glu Asn Gly
            20                  25                  30
Gly Asn Thr Ile Gly Thr Arg Asp Glu Thr Ala Lys Phe Ala Asp Ala
        35                  40                  45
Val Asp Val Ser Leu Val Glu Gly Ser Asn Asp Ile Met Gly Ser Thr
    50                  55                  60
Asn Phe Lys Glu Leu Pro Gly Arg Glu Gly Asn Arg Val Asp Ala Gly
65                  70                  75                  80
Ser Gln Asn Ala His Gln Gly Lys Val Glu Glu His Tyr Pro Pro Ala
                85                  90                  95
Pro Ser Lys Glu Lys Arg Lys Glu Gly Ser Ser Asp Ala Ala Glu Ser
            100                 105                 110
Thr Asn Tyr Asn Glu Ile Pro Lys Asn Gly Lys Gly Ser Thr Arg Lys
        115                 120                 125
Gly Val Asp His Ser Asn Arg Asn Gln Ala Thr Leu Asn Glu Lys Gln
    130                 135                 140
Arg Phe Pro Ser Lys Gly Lys Ser Gln Gly Leu Pro Ile Pro Ser Arg
145                 150                 155                 160
Gly Leu Asp Asn Glu Ile Lys Asn Leu Met Asp Ser Phe Asn Gly Pro
                165                 170                 175
Ser His Glu Asn
            180


<210> 14
<211> 180
<212> PRT
<213> Artifical Sequence

<400> 14
Gln Thr Gly Phe Ala Gly Pro Ser Glu Ala Glu Ser Thr Asn Leu Asp
 1               5                  10                  15
Ile Lys Phe Pro Gly Tyr Asn Phe Ile Pro Phe Arg Lys Phe Asn Gly
            20                  25                  30
Gly Asn Thr Ile Gly Thr Gly Asp Glu Thr Ala Lys Ile Phe Ala Asp
        35                  40                  45
Ala Val Asp Val Ser Leu Val Glu Gly Asn Asn Asp Ile Met Gly Ser
    50                  55                  60
Thr Asn Phe Lys Glu Leu Pro Gly Arg Glu Gly Asn Arg Val Asp Val
65                  70                  75                  80
Gly Gly Gln Asn Ala His Gln Gly Lys Val Glu Phe His Tyr Pro Pro
                85                  90                  95
Ala Pro Ser Lys Glu Lys Arg Lys Glu Gly Ser Ser Asp Ala Thr Glu
            100                 105                 110
Ser Thr Asn Tyr Asn Glu Ile Pro Lys Asn Asp Lys Gly Ser Ala Arg
        115                 120                 125
Lys Gly Val Asp Asp Ser Asn Arg Asn Gln Ala Ile Leu His Glu Lys
    130                 135                 140
Gln Arg Phe Pro Ser Lys Gly Lys Ser Gln Gly Leu Pro Ile Pro Ser
145                 150                 155                 160
Arg Gly Leu Asp Asn Glu Ile Lys Thr Glu Met Asp Ser Leu Asn Gly
                165                 170                 175
Pro Ser Asn Glu
            180


<210> 15
<211> 169
<212> PRT
<213> Artifical Sequence

<400> 15
Arg Pro Leu Ser Gly Ser Ser Lys Ala Glu Val Ile Asp Pro His Met
```

```
 1               5                  10                  15
Ser Gly Leu Gly Ser Asn Glu Ile Pro Gly Arg Glu Gly His Gly Gly
            20                  25                  30
Ser Ala Tyr Ala Thr Arg Asp Lys Ala Ala Gln Gly Ala Gly Ser Ala
        35                  40                  45
Gly Gly Ser Leu Val Gly Gly Ser Asn Glu Ile Ile Gly Ser Thr Asn
    50                  55                  60
Phe Arg Glu Leu Pro Gly Lys Glu Gly Asn Arg Ile Asn Ala Gly Ser
65                  70                  75                  80
Gln Asn Ala His Gln Gly Lys Val Glu Phe His Tyr Pro Gln Val Ala
                85                  90                  95
Ser Arg Glu Lys Val Lys Gly Gly Val Glu His Ala Gly Arg Ala Gly
            100                 105                 110
Tyr Asn Glu Ile Pro Lys Ser Ser Lys Gly Ser Ser Ser Lys Asp Ala
        115                 120                 125
Glu Glu Ser Lys Gly Asn Gln Leu Thr Leu Thr Ala Ser Gln Arg Phe
    130                 135                 140
Pro Gly Lys Gly Lys Ser Gln Gly Pro Ala Leu Pro Ser His Ser Leu
145                 150                 155                 160
Ser Asn Glu Val Lys Ser Glu Glu Asn
                165
```

<210> 16
<211> 169
<212> PRT
<213> Artifical Sequence

<400> 16

```
Arg Pro Leu Ser Gly Ser Ser Lys Ala Glu Val Ile Asp Pro His Met
 1               5                  10                  15
Ser Gly Leu Gly Ser Asn Glu Ile Pro Gly Arg Glu Gly His Gly Gly
            20                  25                  30
Ser Ala Tyr Ala Thr Arg Asp Lys Ala Ala Gln Gly Ala Gly Ser Ala
        35                  40                  45
Gly Gly Ser Leu Val Gly Gly Ser Asn Glu Ile Ile Gly Ser Thr Asn
    50                  55                  60
Phe Arg Glu Leu Pro Gly Lys Glu Gly Asn Arg Ile Asn Ala Gly Ser
65                  70                  75                  80
Gln Asn Ala His Gln Gly Lys Val Glu Phe His Tyr Pro Gln Val Ala
                85                  90                  95
Ser Arg Glu Lys Val Lys Gly Gly Val Glu His Ala Gly Arg Ala Gly
            100                 105                 110
Tyr Asn Glu Ile Pro Lys Ser Ser Lys Gly Ser Ser Ser Lys Asp Ala
        115                 120                 125
Glu Glu Ser Lys Gly Asn Gln Leu Thr Leu Thr Ala Ser Gln Arg Phe
    130                 135                 140
Pro Gly Lys Gly Lys Ser Gln Gly Pro Ala Leu Pro Ser His Ser Leu
145                 150                 155                 160
Ser Asn Glu Val Lys Ser Glu Glu Asn
                165
```

<210> 17
<211> 179
<212> PRT
<213> Artifical Sequence

<220>
<223> Description of Artificial Sequence: Note =
Synthetic Construct

<220>

<221> VARIANT
<222> 61, 421, 901, 1021 1381
<223> Xaa = Any Amino Acid

<400> 17

```
Xaa Xaa Gly Xaa Xaa Gly Xaa Ser Xaa Ala Glu Xaa Xaa Xaa Xaa Xaa
 1               5                  10                  15
Ile Xaa Xaa Xaa Gly Xaa Asn Glu Ile Pro Xaa Arg Glu Xaa Xaa Gly
            20                  25                  30
Gly Xaa Xaa Xaa Xaa Thr Arg Asp Xaa Thr Ala Xaa Xaa Ala Xaa Xaa
        35                  40                  45
Xaa Val Ser Leu Val Glu Gly Xaa Asn Xaa Ile Xaa Gly Ser Ile Asn
    50                  55                  60
Phe Xaa Leu Leu Pro Gly Xaa Glu Gly Asn Arg Val Asp Asp Gly Ser
65                  70                  75                  80
Gln Asn Ala His Gln Gly Lys Val Phe Phe His Tyr Pro Xaa Ala Pro
                85                  90                  95
Ser Lys Glu Lys Xaa Lys Xaa Gly Ser Xaa Xaa Xaa Xaa Xaa Xaa Xaa
            100                 105                 110
Xaa Tyr Asn Glu Ile Pro Lys Xaa Xaa Lys Gly Ser Xaa Xaa Lys Xaa
        115                 120                 125
Xaa Xaa Xaa Ser Xaa Xaa Asn Gln Xaa Thr Leu Xaa Glu Xaa Gln Arg
    130                 135                 140
Phe Pro Xaa Lys Gly Lys Ser Gln Gly Ile Pro Ile Pro Ser Xaa Xaa
145                 150                 155                 160
Leu Xaa Asn Glu Xaa Lys Xaa Glu Xaa Asp Ser Xaa Asn Gly Pro Ser
                165                 170                 175
Xaa Glu Asn
```